

XXIII. NOTES ON ORIENTAL DRAGON-FLIES IN THE INDIAN MUSEUM.

No. 3.—INDIAN SPECIES OF THE 'LEGION' PROTONEURA.

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The distribution of the species belonging to this 'Legion' in British India and Burma is very interesting, although probably still inadequately known. The species of the group have as a rule a restricted range and are all to a great extent forest-haunting insects, at least they are not commonly found in areas which have been much affected by human industry.

The museum collection contains what are, I believe, the first examples of the Legion recorded from the Himalayas. From what is known of the group it appears probable that whilst Ceylon and the Deccan are inhabited by a rich and peculiar series of species, the great river valleys have no representatives of the group, whilst the great mountain ranges of the north possess few species, only one, namely that here described as a new species under the name of *Protosticta carmichaeli*, being recorded. Burma shows a distinct Malayan influence in the possession of three species, all with a range right down the Malay Peninsula. With the somewhat scanty material available it is impossible to dogmatize as to the distinctness of the Ceylon fauna from that of the Deccan. But it may be noted that whilst *Disparoneura quadrimaculata* (Ramb.) appears to be common in the Satara district, and was first recorded from 'Bombay', it does not occur amongst the material collected in Cochin State by Mr. Gravely, and so far as I know is not recorded from any locality so far south. Further, it is worth remark that none of the species from Ceylon have been recorded from the mainland, and also that no mainland species is known from Ceylon. The sole exception is *Platysticta maculata*, Selys, which has a distinct representative race in Cochin State readily distinguished from the typical Ceylon form. The following table shows the recorded species with their known distribution.

CEYLON.

<i>Platysticta maculata</i> , Selys.	<i>Platysticta tropica</i> , Selys.
„ <i>apicalis</i> , Kirby.	* „ <i>hilaris</i> (Hagen).
„ <i>montana</i> , Selys.	„ <i>digna</i> , Selys.

Species marked thus * are represented in the museum collection.

<i>Disparoneura caesia</i> (Selys).	<i>Disparoneura sita</i> , Kirby.
„ <i>centralis</i> (Selys).	„ <i>oculata</i> , Kirby.
„ <i>tenax</i> (Selys).	

S. INDIA.

(Nilgiri Hills; Cochin State.)

Disparoneura westermanni (Selys).„ *gomphoides* (Ramb.).**Platysticta maculata deccanensis*, subsp. n.**Protosticta graveleyi*, sp. n.

BOMBAY PRESIDENCY.

**Disparoneura quadrimaculata* (Hagen).

HIMALAYAS.

(Darjiling District).

**Protosticta carmichaeli*, sp. n.

BURMA-ASSAM.

<i>Platysticta quadrata</i> , Selys.	<i>Disparoneura verticalis</i> (Selys).
<i>Disparoneura atkinsoni</i> , Selys.	„ <i>interrupta</i> (Selys).

***Platysticta maculata deccanensis*, subsp. n.**

(Text-fig. 1.)

^{22.30}/₂₀ 5 ♂♂, Kavalai, Cochin State, 24-27-ix-14 (in spirit).

Length of abdomen 45 mm., of hind-wing 32.5 mm.

Differs from the typical race from Ceylon as follows:—

The prothorax is dark brown above. The thorax is brown without markings save for a fine black line along the mid-dorsal carina. The brown colouring becomes paler on the sides and ventrally.



FIG. 1.—Anal appendages of one side of *Platysticta maculata deccanensis* ♂, seen rather obliquely from above.

Segments 8-9 of the abdomen vivid turquoise blue above. Segment 10, which is very short, is entirely black.

I have figured the anal appendages of the male; they are evidently very similar to those figured by Kirby for his *Platysticta greeni*, which he subsequently regarded as a synonym of *P. maculata*, Selys (see Kirby, *Proc. Zool. Soc. Lond.*, 1891, p. 203, pl. xx, figs. 3,

3a and *J. Linn. Soc.* XXIV, p. 561, 1893).

Platysticta hilaris (Hagen).*Platysticta hilaris*, Kirby, *Cat. Odonata*, p. 132 (1890)." " *id.*, *J. Linn. Soc.* XXIV, p. 562 (1893). $\frac{5.515}{2.0}$ 1 ♂, Kandy, Ceylon, 21-i-10.

The prothorax in this specimen appears to be uniformly dark on the dorsal surface. The middle lobe of the prothorax carries a pair of small rounded bosses, one on either side of the middle line. The colouring of the abdominal segments is evidently much faded, but the specimen is, I believe, identical with that described in de Selys' synopsis under this name.

Protosticta gravelyi, sp. n.

(Text-fig. 2.)

 $\frac{5.231}{2.0}$ 1 ♂ 1 ♀, Kavalai, 1300-3000 ft., Cochin State, 24—27-ix-14 (spirit specimens).

♂. Length of body 44 mm., of hind-wing 21 mm.

Head, under surface brownish black, upper lip, genae and anteclypeus white, the upper lip with a fine black margin, the rest of the dorsal surface black.

Prothorax white; a black triangle occupies the posterior lobe and its apex extends forward on to the middle lobe. Thorax black, with a metallic lustre on the dorsum; laterally marked with two moderately broad bands of white, of which the anterior encloses the stigma; ventral surface black, but the infra-episternum is white.

Abdomen, segments 1-2 black above, sides and ventral surfaces white, but the genital appendages on 2 are tinged with dark brown. Segments 3-7 each with a white sub-basal ring, which laterally and ventrally is more extensive than it is dorsally. In the case of segment 7 the white mark is divided dorsally by a fine longitudinal line which is black, and it occupies about the first third of the dorsum of the segment; ventrally it extends for two-thirds of the length of the segment. On end of segments 3-6 the white mark is much less extensive occupying only a small fraction (one-tenth or less) of the dorsum of the segment. There are no markings on segments 8-10 which are entirely black.

The relative length of the abdominal segments is as follows:

$$1 : 2\frac{1}{2} : 9 : 9 : 10 : 10 : 8 : 3 : 1 : \frac{1}{2}.$$

Legs white, with black ridges and cilia.

Anal appendages about twice as long as segment 10. Upper pair stout at their bases with a small angular projection on their inner side; curved inwards and downwards, strongly chelate at their distal extremities. Lower pair rather slender, simple, curved



FIG. 2.—Anal appendages of *Protosticta gravelyi* ♂, seen from the side.

a little upwards, shorter than the upper pair. Colour entirely black.

Venation, 13 postnodals. Pterostigma rather large, covering one and a half cells, its anal margin longer than the costal and its inner side oblique. M_3 rising from nerve descending from nodus, R_s one cell more distal. The rudiment of Cu_2 lies rather nearer the level of the second antenodal nerve than of the first.

The female specimen is very immature and too much macerated for measurement. It is possible to determine that the colouring is generally similar to that of the male, but that segments 8 and 9 of the abdomen have white lateral markings; also that the posterior lobe of the prothorax is simple and that segment 8 of the abdomen is about equal in length to segment 9.

This species is readily distinguished from other members of the genus by the remarkable chelate superior anal appendages of the male.

Protosticta carmichaeli, sp. n.

(Text-fig. 3.)

C.c. 1066-67 2 ♂ 2 ♀, Darjiling Dist.: Singla, 1500 ft. (spirit specimens, all in poor condition).

♂. Length of abdomen 35 mm., of hind-wing 22 mm.

Head, upper lip bluish-white, the whole of the rest of the dorsal and posterior surfaces bronze-black.

Prothorax and thorax also bronze-black dorsally; underneath dull black.

Abdomen, segment 1 dark brown. Segments 2-6 yellowish-brown, darker in the middle part of the segment. Each segment has a light apical ring and a dark terminal ring. Segment 7 is all dark brown save for a small apical ring which is light yellowish-brown. The three terminal segments are uniformly black, the tenth segment is very short.



FIG. 3.—Anal appendages of *Protosticta carmichaeli* ♂, seen a little obliquely from the left side.

The legs are yellowish-brown, with cilia of the same colour. Anal appendages black, upper pair more than twice as long as the tenth segment. They are A-shaped when seen in profile; towards its distal extremity each is flattened a little from side to side. The lower pair is shorter than the upper pair, cylindrical and nearly straight; each curves inwards a little at its free extremity.

Venation, 13 postnodals on the fore-wing. Pterostigma covering one cell, its anal margin a very little longer than its costal. M_3 rising from nerve descending from nodus, R_s about one cell distally. Rudiment of Cu_2 half-way between level of first and second antenodals.

The condition of the female specimens is such as to make description impossible. Generally speaking the colouring is similar to that of the male. The posterior margin of the prothorax is simple.

Note on the genus *Protosticta*.

Seven species of this genus have been named. It ranges from S. India, the Himalayas and the Malay Peninsula to Borneo and to Celebes. The genus appears to be a specialized form derived from *Platysticta*. It is even possible that the genus is polyphyletic, and in support of this view one might urge that *P. gravelyi* bears a very strong resemblance to the large species of *Platysticta* which occur in Ceylon, whilst the Bornean species resemble rather the small Malayan *Platystictas*. On the other hand all the species of *Protosticta* are alike in the great relative length of the very slender abdomen, and generally in venation; whilst the rather large Celebesian species resemble the large Ceylon *Platysticta* spp.

***Disparoneura quadrimaculata* (Ramb.).**

Disparoneura quadrimaculata, Selys, *Bull. Acad. Belg.* (2) X, p. 446 (1860).

" " *id.*, *Mem. Cour.* XXXVIII, p. 163 (1836).

" " Kirby, *Cat. Odonata*, p. 133 (1890).

$\frac{5.1.0}{2.0}$ 1 ♂ 1 ♀ (pinned), Medha, Yenna Valley, Satara district, ca. 2200 ft., 17-iv-12 (*F. H. Gravely*).

$\frac{5.5.0}{2.0}$ + ♂ 1 ♀ (in spirit), from the same locality.

